September 2011

Model 300 Overview

The Model 300 programmer supports JTAG programming of all Lattice devices that feature non-volatile configuration elements. The Model 300 is used when a device must be programmed prior to being soldered onto a printed circuit board.

Figure 1. The ISP Engineering Kit - Model 300

Device Support

All Lattice products that feature non-volatile configuration elements are supported. This includes devices with a V_{CC} of 1.2V, 1.8V, 2.5V, 3.3V and 5V.
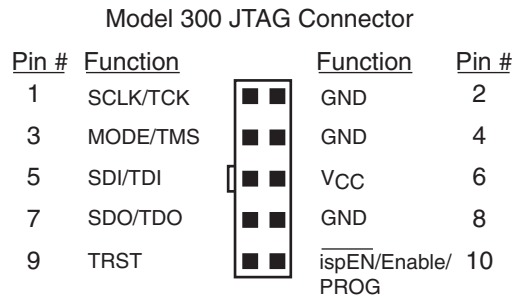
Socket Adapters

Individual devices are supported via device/package-specific socket adapters, which interface to the 28-pin DIP on the Model 300. For a complete list of supported devices and socket adapters, see the Socket Adapter list on the Lattice web site at www.latticesemi.com/products/developmenthardware/socketadapters.cfm.

Connection to PC

A Lattice ispDOWNLOAD Cable is included with the Model 300 programmer. This cable connects to a PC Parallel port on your PC, and to a 2x5 connector on the Model 300. The programming operation is controlled with the Lattice ispVM System software, available for download from www.latticesemi.com/ispvm.

The orientation of the wires on the 2x5 connector is shown in Figure 2.

Figure 2. ispDOWNLOAD Cable In-System Programming Interface for the PC

Model 300 JTAG Connector

Pin #	Function			Function	Pin #
1	SCLK/TCK	■	■	GND	2
3	MODE/TMS	■	■	GND	4
5	SDI/TDI	■	■	V$_{CC}$	6
7	SDO/TDO	■	■	GND	8
9	TRST	■	■	$\overline{\text{ispEN}}$/Enable/ PROG	10

See the ispDOWNLOAD Cable data sheet for the full specifications of the cable and 10-pin connector.

Power Supply Support

The Model 300 programmer requires 9V DC at 1A minimum, to provide power for the programmer itself and for programming the target device. A 9V power adapter is included with each kit. This power adapter accepts 110V to 220V inputs, and includes interchangeable physical plugs for use worldwide. In Figure 1, the power adapter is shown with the US style plug installed.

Programming Software Support

The interface software that controls the Model 300 programmer is included with Lattice's ispVM System version 9.0.4d and later.

The ispVM System software can be downloaded from the Lattice website at www.latticesemi.com/ispvm.

Special Features

With the exception of programmer power, the Model 300 programmer is controlled entirely by the programming software. The user simply selects the device, programming adapter configuration and the target device V$_{CC}$. LEDs indicate the power status and the selected V$_{CC}$ level.

Installation Procedure

To install the Model 300 programming software, install the latest version of ispVM System software. If you are running Windows NT or Windows 2000, you will need to install the ISP NT driver. The ispVM installation will prompt you to install the ISP NT driver.

Operation Procedure

Setting Up the Hardware

Before you can use the Model 300 programmer, you must connect a download cable to your PC.

To set up your Model 300 programmer:

1. Turn on and boot up the PC. (**Important**: Do not boot or restart the PC when the Model 300 is on and has a device in the programming adapter socket. Its behavior is not ensured if it is on when the PC tests the parallel port).
2. With the Model 300 programmer in the power off position, connect the download cable between the PC parallel port and the Model 300 programmer.
3. Connect the power supply to a properly grounded AC outlet and to the AC plug at the rear of the Model 300 programmer.
4. Make sure the PC has booted up completely, and then turn on the Model 300 programmer.

5. Place the device in the programming adapter socket. The 1.8V and PWR RDY LED indicators illuminate, indicating that the Model 300 is ready for programming. The LEDs are shown in Figure 3.

Figure 3. Model 300 LEDs

## Starting the Model 300 Programmer Software

To open the Model 300 programmer software:

1. Make sure the Model 300 programmer is connected and on.

2. Start the ispVM System software, if it is not already running.

3. On the toolbar, click the Model 300 icon.   **M 300**

The Model 300 user interface opens, as shown in Figure 4. The status box at the bottom advises, "Please select a device to start."

Figure 4. Model 300 User Interface
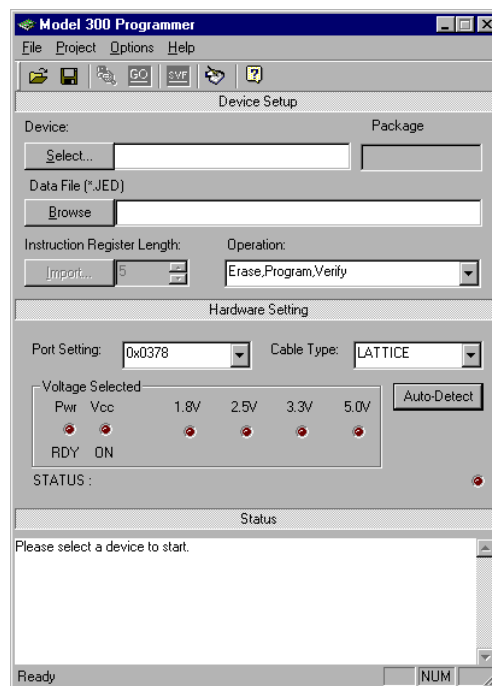
Programming a Device

1. If using a 28-pin socket adapter, insert the socket adapter into the 40-pin ZIF socket of the Model 300, shown in Figure 5. Make sure that the socket adapter is bottom-justified. (Note: If the socket adapter is not bottom-justified, the Model 300 will not read or program the device).

   If using a Lattice socket adapter board, insert the socket adapter board pins into the appropriate connector on both sides of the 40-pin ZIF socket of the Model 300, shown in Figure 5. Make sure that all pins are inserted correctly.

Figure 5. Model 300 40-pin ZIF Socket and Socket Adapter Board Connectors
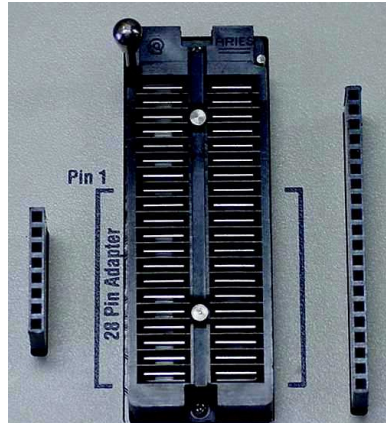
2. Using proper ESD handling procedures, place the device in the programming adapter socket, and ensure the correct alignment of the device.

3. In the Model 300 main window, under Device, click **Select**, to open the Select Device dialog box.

4. Select the appropriate device, device family and package, and then click **OK** to return to the main window.

   In the Model 300 main window, the Power and Voltage LED indicators illuminate, and the Status indicates Ready. The LED under Auto Detect illuminates and blinks. The user interface LED's are shown in Figure 4. If the correct LED indicators do not illuminate, you may have selected the wrong device.

   1.2V devices are treated as 3.3V devices by both the programmer and software. Lattice socket adapters for these devices contain a internal voltage regulator circuit to supply the appropriate programming voltage.

5. Under Data File, click **Browse** to select the JED (JEDEC) file.

6. Choose **Project > Download** or click the **GO** button to download the program to the device.

   The V_{CC} ON indicator turns red during the download process. It turns off when the operation is completed. The Status box indicates the progress of the operation, reports any errors, and shows whether the operation was successful or not.

7. When done, remove the device from the adapter socket.

8. Turn off the Model 300 programmer (optional).

Hiding and Displaying Panels

You can save desktop space by shortening the main window and toggling the panel bar for the panel you want displayed, as shown in Figure 6.

Figure 6. Shortened Display Area
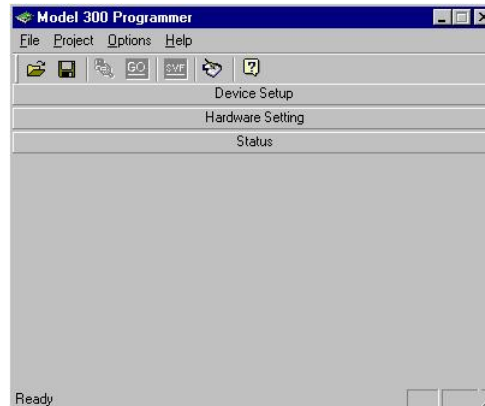
To shorten the display area and hide one or more panels:

1. Toggle the panel displays OFF by clicking on each panel bar and drag the bottom edge of the main window upward until it is the desired size (Figure 6).

2. Click the desired panel bar to toggle its display ON (Figure 7).

Figure 7. Shortened Display Area - Hardware Setting Panel Toggled ON
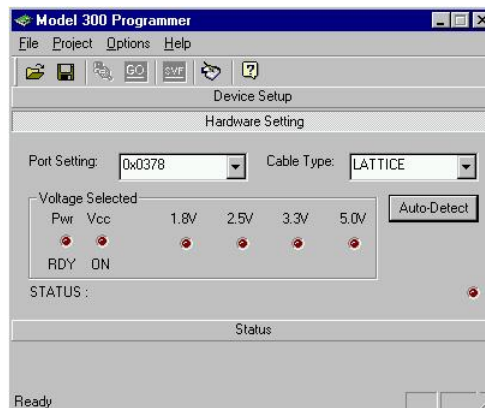
Selecting Project Settings

You can specify how the software will process the active chain configuration by using the Project Settings command.

To select project settings:

1. Choose **Project > Project Settings** to open the Project Settings dialog box.

2. Select the appropriate check boxes for the specifications you want to include.

3. Choose between TLR and RTI for the starting and stopping TAP states.

4. To change the TCK clock pulse for an optional JTAG signal, click **Advanced**, and then type a different level in the TCK Clock pulse box.

5. Click **OK**.

Checking the Configuration Setup

To check the current configuration setup:

1. Choose Project > Configuration Setup.

    If the configuration check is successful, you will see a note to that effect in the Status box. If the configuration check is unsuccessful, an error message will appear in a dialog box.

2. If the configuration check is unsuccessful, click **OK**, and then run Board Diagnostics to try to pinpoint the problem.

Running Diagnostics

To run diagnostics:

1. Choose **Project > Board Diagnostics** to open the Board Diagnostics dialog box.

2. Compare the expected devices with those detected by the software. If they do not match, edit the chain configuration file and run the diagnostic again.

Changing File Locations

To change file locations:

1. Choose **Options > File Locations** to open the File Locations dialog box.

2. Browse to change the locations of the database, start and working directories, and log file name.

3. Select **Clear Log File**, if you would like the software to clear the contents of the log file each time you start the Model 300 programmer.

Repeating the Download

Specify the number of times you would like the software to process a chain for download.

To specify download repetitions:

1. Choose **Options > Repetitive Download** to open the Repetitive Download dialog box.

2. Select the number of repetitions.

3. Select the number of errors you want to allow before the software stops the download process, and then click **OK**.

Ordering Information

Description	Ordering Part Number	China RoHS Environment-Friendly Use Period (EFUP)
Lattice Model 300 Desktop Programmer (RoHS-compliant)	pDS4102-PM300N	
Lattice Model 300 Desktop Programmer (Non-RoHS, replaced by RoHS-compliant version)	pDS4102-PM300 (Obsolete)	

Technical Support Assistance

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e-mail: techsupport@latticesemi.com

Internet: www.latticesemi.com

Revision History

Date	Version	Change Summary
—	—	Previous Lattice releases.
March 2007	02.3	Added Ordering Information section.
October 2008	02.4	Updated product photo.
March 2009	02.5	Updated Ordering Information table.
June 2011	02.6	Updated figure: ispDOWNLOAD Cable In-System Programming Interface for the PC.
September 2011	02.7	Updated Power Supply Support text section.

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